
Noufal K.P
Research Scholar, Research and Development Centre Bharathiar University, Coimbatore
Dept. of Computer Science, NAM College Kallikkandy, Kannur, Kerala, India

Abstract
A Wireless sensor Network is an organized collection of a large number of small nodes with a capability of sensing, measuring and computing. These networks are mostly used for tracking, monitoring and controlling. The WSNs collect information from unattended locations and disseminate information to a specific user depending on the requirement. Data are routed amongst the nodes by using an appropriate routing technique. A number of factors affect the design of the routing protocols. Scalability one such important factor which influence the routing protocols. Scalability is that increase in the number of nodes after the WSN was established. Whether or not the WSN support the expansion is a very important factor in the design of the protocol. The routing protocols consider the sensor node characteristics in the design of the protocols. A routing protocol is said to be good when it is scalable and adaptive to the changes made in the topology. The protocols must work intact even though the size of network grows and the workload is increased.

Keywords
Scalability, Routing, Routing Protocol

I. Introduction
A Wireless Sensor Network (WSN) is a wireless network consisting of spatially distributed autonomous devices using sensors to cooperatively monitor physical or environmental conditions, such as temperature, sound, vibration, pressure, motion or pollutants, at different locations. A Wireless Sensor Network (WSN) consists of base stations and a number of wireless sensors (nodes).

These sensors work with each other to sense some physical phenomenon and then the information gathered is processed to get relevant results. Wireless sensor networks consists of protocols and algorithms with self-organizing capabilities. Wireless sensor networks mainly use broadcast communication. Unlike ad hoc networks wireless sensor networks are limited by sensors limited power, energy and computational capability. The nodes possess low battery life and least processing capability and minimum bandwidth and range. In WSNs sensing data and processing are key features. The nodes are very densely deployed and normally the communication is in nearest neighbor mode. One disadvantage is that the nodes are more susceptible for failure and operated on strict energy constraints. The data from a large number of nodes is collected generally by the base station. Hence the data transmission is many to one against peer to peer. The nodes are powered through battery hence any operation by the node take it near to death. Keeping the importance of life time of the nodes, the nodes will be kept in sleep mode when they are idle and the nodes acquire data when it is necessary and crucial. The nodes receive or transmit only when it is inevitable. A WSN should self configure and robust to topological changes.

II. Data Dissemination in WSNs
Keeping the low power back up of the nodes maximum care must be taken while disseminating data to various nodes in the WSN. In the conventional way of data dissemination, the nodes directly communicate with the base station hence the power consumption is very high and is not good. Another way of communication is multi hop method in which the data is transmitted through some intermediate nodes and the power consumption here also is very high.

III. Routing Protocols in WSNs
Routing in WSNs is different when compared with other networks. In WSNs the wireless links are not so reliable, the nodes may fail and the protocols should meet the power saving requirements. Routing in WSNs is challenging because the capabilities of the sensor nodes is very much limited. The sensor nodes communicate in a short distance through a wireless medium and cooperate to accomplish a common task.

In the Location based protocols, sensor nodes are identified by the location address of the respective nodes. This information is required to calculate the distance between two nodes. In Location based transmission each sensor node send its data independently. In Data centric transmission, when a node need to send data to the sink, the intermediate nodes perform some data aggregation.
activity and finally transmit data to the sink. So that the power consumption by individual nodes is reduced. In the Hierarchical protocols the nodes are clustered and the transmission is done through the cluster head so that the power consumption is reduced. The mobility based protocols guarantee the delivery of data from source to the mobile sinks. In multipath protocols the data is transmitted from source to the sink in two different ways 1) single path and multipath. In single path routing each node transmit the data to the sink through a shortest path from source to the sink where as in the multipath routing the a number of shortest paths will be found and the data will be evenly distributed transmitted to the sink. In the heterogeneity protocols use line powered and battery powered sensors. The QoS based protocols bring out balance between QoS and energy consumption. One important objective of the routing protocol for WSN is to keep the sensors alive for longer time. All these protocols generally consider classification criteria which include information like location information, network layering and in-network processing, data centricity, path redundancy, network dynamics, QoS requirements, and network heterogeneity. The performance of the routing protocols can be measured using the parameters like Network delay, Throughput, success rate, latency, Energy consumed and Life time.

III. Scalability of WSNs

Scalability is very important and crucial issue in the design of routing protocols for WSNs. A routing protocol is considered to be good and effective if it is scalable to the changes in the topology of the network. The protocol should withstand and perform well with changes that may occur from time to time in the WSN. The WSN is said to be scalable if it accommodate more nodes at a later stage after the design. The protocols for WSNs should perform well even on the event of growth in the number of nodes or the workload on the network increases. A survey and review on various protocols in the context of increase of the size of the network revealed that the Beacon Vector routing protocol (BVR) proved good for the performance parameter success rate compared to PGR and flooding protocols over different network sizes. The BVR protocol has shown good throughput compared to Flooding and PGR protocols when the number of nodes in the WSN is increased. With the increasing network size, when the the performance parameter Latency rate is considered PGR protocol gave a lower latency compared to flooding protocol. When the number of nodes in the network increases, the energy consumption in BVR protocol is the minimum compared to all other protocols.

Conclusion

In this work we have conducted a review of various protocols with respect to the scalability of the WSN and observed that the BVR protocol is the efficient protocol for scalability. We made a critical review of various performance parameters and revied their role in the performance of the WSN protocols.

References


NOUFAL.K.P, Research Scholar, Research and Development Centre Bharathiar University, Coimbatore AND Department of Computer Science, NAM College Kallikkandy, Kannur, Kerala, India.